Space Weather Forecast

Issued on Sunday, 14 April 2024 at 01:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance Minor-Moderate geomagnetic storms (G1/G2) day 1-2 (14/15 Apr) from CME arrivals, and arrival of fast solar winds. Chance of isolated Moderate flares.

Solar Activity: Moderate with one M-class flare at 13/0502 UTC from a new small sunspot region in the southeast. There are ten sunspot regions on the disc, however the majority are small and simple. The largest region is in the northwest has seen some slow growth, but remains a simple bipolar configuration. This also produced a Common class flare peaking 13/1459 UTC. A number of small sunspots are visible within plage on both the southeast and northeast limbs, and further regions have the potential to rotate onto the disc.

A coronal mass ejection (CME) was produced from the common class flare, however this appears to be slow and relatively narrow and will largely pass north and behind Earth, although analysis is ongoing. No other Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: Solar winds showed a slow wind regime with speeds persisting at background. The Interplanetary Magnetic Field (IMF) weak with the north-south component also weak and variable in direction. Resultant geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no Solar Radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected, with a chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: There are two CMEs with potential Earth-directed components. The first from 11 Apr, with a glancing impact possible later day 1 (14 Apr). The second from 12 Apr, and most likely to give a direct impact but is faint in imagery leading to low confidence with its strength, most likely arriving day 2 (15 Apr). Otherwise, onset of coronal hole fast wind is expected to occur day 1 (14 Apr), with slightly elevated wind speeds, before easing again day 3-4 as any CME influence also recedes. Geomagnetic activity is expected to increase from initially Quiet to be Active with a chance G1 Minor to G2 Moderate Storm intervals on each of day 1 and day 2 (14-15 Apr) from the combined fast wind or CME arrivals. Activity easing to be mainly Quiet thereafter.

This level of activity has the potential to bring visible aurora to parts of northern UK, primarily north Scotland, on Sunday and Monday night. However this is low confidence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no Solar Radiation storms occurring, with only a slight chance of increasing if any larger flares occur from the larger of the sunspot regions in the northwest disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	50	5	1
Strong	G3	No	5	10	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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